MINOS Electronics Crate Specification

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INTRODUCTION: This specification calls out a 21-slot 9Ux400 mm front, 9Ux 120mm rear VME crate with a 4 slot 6Ux160mm subrack in the front. A total of **36** units are to be built. The cooling unit and the power supplies for the crate will be bid separately.

REQUIREMENTS

1. Subrack Dimensions: 10U x 84HP (x 615mm reference). A 1U space at the top of the crate will support power termination.
2. Crates should have flanges for mounting the crate into a standard 19" wide rack. Side plates for the crate must be a minimum of 1/8" (3mm) thick.
3. The crate must be able to support a load providing a force of 0.5 lb. / HP (2.5 lb. / inch) distributed on the front rail, card guides and other cross members in the bottom of the crate, with a deflection of the front rails, card guides and other cross members of less than 0.016 inches
4. Must accept 9Ux400mm deep front cards and 9Ux120mm deep rear cards.
5. Must include 21 slot, monolithic VME64x J1 and J2 backplanes which meet the specification found in the VME64 extensions draft specification (VITA 1.1-1997 R2.0). There is to be no J0.
6. The backplane must be rated to provide at least the following power to each of the 21 slots at 25 deg. C ambient: 10 Amps @ +5V; 15 Amps @ +3.3V; 2 Amps @ +12V; 2 Amps @ -12V. Bus bars will be required to distribute current along the backplane for the +5 volt and +3.3 volt supplies.
7. The J2 connectors must have pins and shrouds for connection of rear entry transition cards as well as connectors for the front entry cards
8. Must accept a 21 slot, J3 backplane with pins and shrouds for connection of rear entry transition cards as well as connectors for the front entry cards..
9. Must provide a 6U x 160mm subrack in the leftmost 4 slots. The J1 and J2 backplanes would still be continuous throughout both 6U and 9U sections. The 6U sub-section must support modules with standard height faceplates and support injection and ejection style handles**.**
10. We require appropriate baffles for airflow to ensure an even airflow for each of the 21 slots, including the 6U slots. It is expected that a ramp type air baffle will be provided to guide the airflow from the front cooling fan to the start of the 4 slot 6U section of the crate. The air baffle used to separate the 6U cards from the 9U cards may use the 5^{th} slot from the left in the crate for this purpose if necessary.
11. Guide rails (top and bottom) for the 9Ux400mm front entry cards must be aluminum except for the plastic snap-in portions. They must have a 2mm slot width. They can be a single rail or a split rail with a sum length of at least 350 mm. In either choice of rails a support bar must be centered (+/- 40 mm) under the bottom guide rails.
12. Guide rails for the front must include ESD grounding clips or fingers.
13. Guide rails (top and bottom) for the rear entry cards must have a 2 mm slot width and be a single snap-in rail 100 mm or longer.
14. Front and Rear rails (top and bottom) should accommodate injector/ejector style handles on the plug-in modules.
15. The space between the J1 and J2 connectors (where a J0 connector would normally go) is to be left open (no support members). This will allow boards with an installed but unused J0 connector to still be inserted into any slot.
16. The rigidity of the J1/J2 backplane shall adhere to the VME specifications so listed in IEEE Std. 1101.1-1991, section 10, paragraph 10.1.
17. There are to be 2 types of J3 backplanes purchased and installed by the vender. For **23** of the crates a 12 slot backplane manufactured by Schroff, # 23030-175, shall be installed covering slot positions 6 through 17. The 1 through 5 and 18 through 21 slot positions of this J3 configuration shall be covered with a FR4 (or similar material) air-flow blocking plates. The J3 backplane installed on the second set of **13** crates shall be a standard 21slot un-bussed VME backplane. Shrouds and pins shall be installed on the backside of both versions of J3.

18. Near the top of the rear corners of each crate side plate, drill or punch 2 .189 inch holes (#12 drill bit). The top holes shall be 2.25 inches from the rear edge of the side plate and .375 of an inch from the top edge. The second hole shall be 1 inch directly below the first hole. See the accompanying drawing.
19. The unit shall be delivered assembled and all backplanes will have been electrically tested to ensure continuity of conductors and the absence of shorting between signals, power, and ground.
20. The vender shall provide 6 completed crates for Fermilab approval before the production run starts. Three of the crates will have the Schroff J3 backplanes, 3 will have the un-bussed J3 backplane (see item 17 regarding the J3 backplanes). The completion of these 6 crates should take no longer than 6 weeks ARO. The Fermilab approval period could take up to 4 weeks.
21. The remaining **30** units are to be delivered within 12 to 16 weeks after approval of the first 6 units.